LISTING OF THE CLAIMS

This listing of claims, amended as indicated below, will replace all prior versions, and listings, of claims in the application

1. (Currently Amended) An apparatus for aligning a bonding tool, comprising:

a force sensor configured to measure a force generated by the bonding tool on the force sensor, wherein the force sensor comprises a plurality of force sensing sections, each sensing section being adapted to individually detect an amount of force from a part of the bonding tool acting on that sensing section,

the apparatus being responsive to the relative values of the detected forces to generate an alignment signal for adjusting the orientation of the bonding tool.

2. (Original) An apparatus as claimed in claim 1, including a collection of piezoelectric ceramic material contained in each sensing section for piezoelectrically detecting the force exerted on that sensing section.

3. (Original) An apparatus as claimed in claim 1, including a transmitting material comprising a plurality of individual electrical conductors coupled to the force sensor such that positions of the electrical conductors coincide with positions of the force sensing sections and channel current produced by each respective sensing section to a respective output terminal.

4. (Original) An apparatus as claimed in claim 3, wherein the transmitting material is coupled to an electronic circuit to which the output terminals are connected for measuring the current produced by each sensing section.

5. (Original) An apparatus as claimed in claim 3, wherein the transmitting material is a polyimide film fabricated with a plurality of individual electrical conductors.

6. (Original) An apparatus as claimed in claim 1, wherein the force sensor is located at an alignment station spaced from the bonding tool, and the bonding tool is positionable onto the alignment station for alignment.

7. (Original) An apparatus as claimed in claim 6, including a biasing member coupled to a sensing surface of the force sensor whereby to exert a preload force on the force sensor.

8. (Original) An apparatus as claimed in claim 1, wherein the force sensor is coupled to the bonding tool.

9. (Original) An apparatus as claimed in claim 8, wherein the bonding tool includes a collet assembly, and the force sensor is coupled to the collet assembly whereby each sensing section is adapted to detect a reaction force acting on a part of the collet assembly upon application of a force by the bonding tool on a bonding surface.

10. (Original) An apparatus as claimed in claim 9, wherein the force sensor is coupled to the collet assembly axially opposite a point of contact between the collet assembly and the bonding surface.

11. (Original) An apparatus as claimed in claim 9, wherein the collet assembly exerts a preload force on the force sensor.

12. (Original) An apparatus as claimed in claim 1, wherein the force sensor comprises a ring with a hollow center.

13. (Original) An apparatus as claimed in claim 1, wherein each sensing area is of substantially equal size.

14. (Withdrawn) A method for aligning a bonding tool, comprising the steps of:

providing a force sensor comprising a plurality of force sensing sections, each sensing section being adapted to individually detect an amount of force from a part of the bonding tool acting on that sensing section;

causing the bonding tool to generate a force onto the force sensor;

measuring the force generated by the bonding tool onto the force sensor; and

adjusting an alignment of the bonding tool based upon the amount of force measured by each sensing section.

15. (Withdrawn) A method as claimed in claim 14, including piezoelectrically detecting the force exerted on each sensing section by locating a collection of piezoelectric ceramic material in the sensing section.

16. (Withdrawn) A method as claimed in claim 14, including separately transmitting a current produced by each respective sensing section to a respective output terminal for processing.

17. (Withdrawn) A method as claimed in claim 16, including measuring the current produced by each sensing section by connecting the output terminals to an electronic circuit.

18. (Withdrawn) A method as claimed in claim 14, including the step of positioning the bonding tool onto an alignment station spaced from the bonding tool whereat the force sensor is located for alignment.

19. (Withdrawn) A method as claimed in claim 18, including exerting a preload force on the force sensor using a biasing member.

20. (Withdrawn) A method as claimed in claim 14, wherein the force sensor is coupled to the bonding tool.

21. (Withdrawn) A method as claimed in claim 20, wherein the bonding tool includes a collet assembly, and the force sensor is coupled to the collet assembly such that upon application of a force by the bonding tool on a surface, each sensing section detects an amount of reaction force acting on a part of the collet assembly.

22. (Withdrawn) A method as claimed in claim 21, including coupling the force sensor to the collet assembly axially opposite a point of contact between the collet assembly and the bonding surface.

23. (Withdrawn) A method as claimed in claim 21, including exerting a preload force on the force sensor using the collet assembly.